



# **STM** (SIP Threat Manager)

## User Manual

# **User Manual**

## **STM Appliance (aSTM)**

Revision 2.2

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# 1. Introduction

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## 1.1. Overview:

STM is an appliance based VoIP threat prevention solution dedicated to protect the SIP based PBX/Telecom Gateway/IP Phones/Mobile devices deployments. The appliance runs the Real time Deep Packet Inspection on the SIP traffic to identify the VOIP attack vectors and prevents the threats impacting the SIP based devices. The appliance has been made to seamlessly integrate with the existing network infrastructure and reduces the complexity of deployment.

The appliance feature set includes,

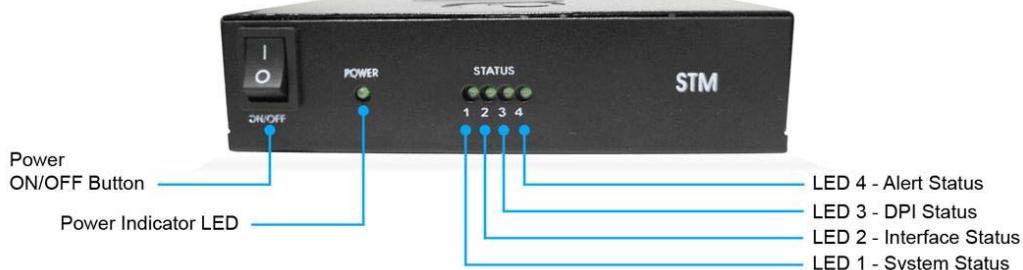
- Analyze SIP packets using the Real time Deep Packet inspection engine.
- SIP Protocol Anomaly detection with configurability of detection parameters.
- Detection and Prevention of the following categories of SIP based Attacks.
  - Reconnaissance attacks ( SIP Devices Fingerprinting, User enumeration, Password Cracking Attempt )
  - Dos/DDos Attacks
  - Cross Site Scripting based attacks.
  - Buffer overflow attacks
  - SIP Anomaly based attacks
  - 3rd Party vendor vulnerabilities
  - Toll Fraud detection and prevention
  - Protection against VOIP Spam & War Dialing
- Attack response includes the option for quietly dropping malicious SIP packets to help prevent continued attacks
- Dynamic Blacklist Update service for VOIP, SIP PBX/Gateway Threats
- Configurability of Blacklist/Whitelist/Firewall rules.
- Support for Geo Location based blocking.
- Provide the option to secure against PBX Application vulnerabilities
- Operate at Layer 2 device thus transparent to existing IP infrastructure - no changes required to add device to your existing network

- Web/SSL based Device Management Access which will allow managing the device anywhere from the Cloud.
- Ability to restrict the device management access to specific IP/Network.
- Provide System Status/Security events logging option to remote syslog server.
- Provides the SIP throughput up to ~10Mbps.
- Support for Signature update subscription and automated signature update mechanism.
- The device has been made to operate with default configuration with just powering on the device. No administrator intervention is required to operate the device with default configuration.
- USB based power supply
- Optional support for security events logging on the USB based storage.

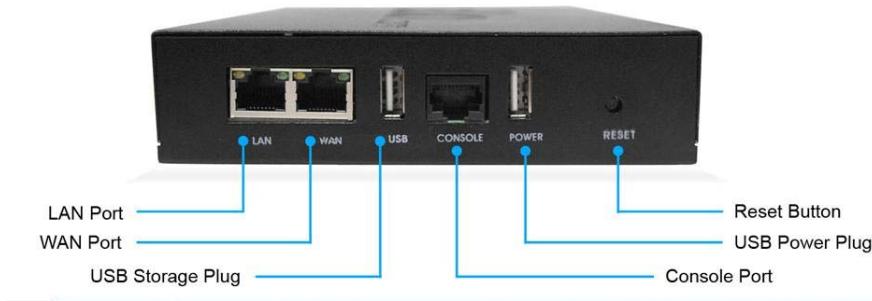
## Technical Specifications

Functional Mode	Transparent Firewall with SIP Deep Packet Engine.
SIP Intrusion/Prevention	~400+ SIP Attack Signatures Support
Throughput	~10Mbps
No of concurrent calls supports	50 concurrent calls
Logging	Local Security Event Console, Remote Syslog
Device Management	Web GUI via Https & SSH CLI
Hardware	MIPS based 32bit Processor Single core, 300MHz
Primary Storage	16 MB Flash
RAM	64MB
Secondary Storage	USB Storage devices support for logging ( Optional)
Interfaces	Two Fast Ethernet Interfaces.

## Notification LEDs (On the Front Panel of the STM)



### STM Rear View:



## 1.2. STM Deployment Considerations

The STM has been made to protect the SIP based PBX/Gateway Servers against SIP based network threats and anomalies. Thus it is recommended to deploy the STM along with the PBX/Gateway deployment as given in the following scenarios based on what is applicable in the user's setup.

### Deployment Scenario 1

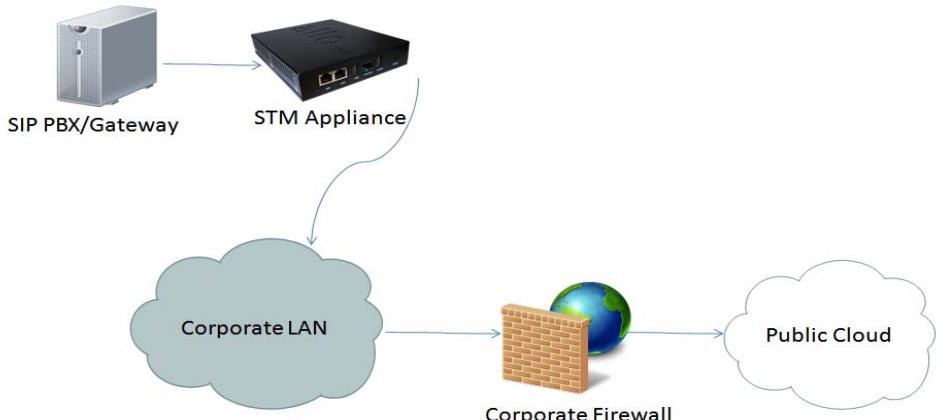


#### Note:

Some of the PBX/Gateway devices may have an exclusive LAN/Mgmt Interface for device management purpose other than the Data Interface (also referred as WAN/Public Interface). In such cases LAN port of the STM should be connected to the Data Interface (WAN/Public Interface).

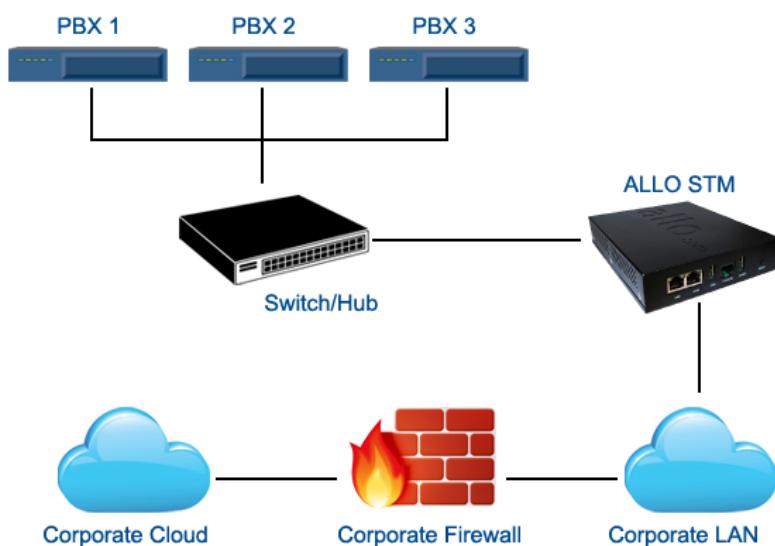
## Deployment Scenario 2

In the case of IPPBX deployed in the LAN Setup, the following setup is recommended as it would help to protect against the threats from both Internal Network as well as the threats from the Public Cloud penetrated the Non SIP aware Corporate Firewall.



## Deployment Scenario 3

In the case of multiple IPPBX/ VOIP Gateways are deployed in the LAN Setup, the following setup is recommended as it would help to protect against the threats from both Internal Network as well as the threats from the Public Cloud penetrated the Non SIP aware Corporate Firewall.



## 2. Initial Setup & Configuration

1. Unpack the items from the box
2. Check that you have all the items listed in the package content.
3. Connect the appliance to the power socket using the USB power cable.
4. Connect the LAN port of the STM to the PBX/VOIP Gateway.
5. Connect the WAN port of the STM to the untrusted/public network.
6. The device will take about a minute to come up & will be fully functional with the default configuration.

**Note:** Some of the PBX/Gateway devices may have an exclusive LAN/Mgmt Interface for device management purpose other than the Data Interface (also referred as WAN/Public Interface). In such cases LAN port of the STM should be connected to the Data Interface (aka WAN/Public Interface).

The device operates as transparent bridging firewall with Deep Packet Inspection enabled on the SIP traffic. By default, the appliance has been made to acquire the IP Address via DHCP.

The device has been made to be fully functional with the default configuration. However if the user needs to tune the device settings & the DPI policies, user can tune the configuration via the Device WebUI.

### 2.2. Default Configuration

The device operates as transparent bridging firewall with Deep Packet Inspection enabled on the SIP traffic. By default, the appliance has been made to acquire the IP Address via DHCP.

The device has been made to be fully functional with the default configuration. However if the user needs to tune the device settings & the DPI policies, user can tune the configuration via the Device WebUI.

The device all provides the command line interface accessible via SSH, which will allow to configure the basic settings and view device status.

Management Access	Login Credentials
WebUI	admin/admin
SSH CLI	admin/stmadmin
Management Vlan IP	192.168.100.1/255.255.255.0

## 2.3. Accessing the WebUI

The user can connect to the device via management vlan to access WebUI during initial setup. The management vlan configured on the device, is accessible via the LAN/WAN ports & is made assigned with the default ip address '192.168.100.1'

Use the procedure given below to access the WebUI,

1. Connect the LAN port of the STM to a PC.
2. Assign the IP Address 192.168.100.2 to the PC. Set the Netmask as 255.255.255.0.

Now you can access the device from the browser using the URL as given below

[https://<192.168.100.1>](https://192.168.100.1)

**Note:**

The WebUI has been made accessible only via HTTPS. The Device WebUI Server has been made to use Self signed PKI Certificate, Thus the browser will prompt to accept the self signed certificate generated by the device on accessing the WebUI.

The recommended browser for accessing STM WebUI is Mozilla Firefox.

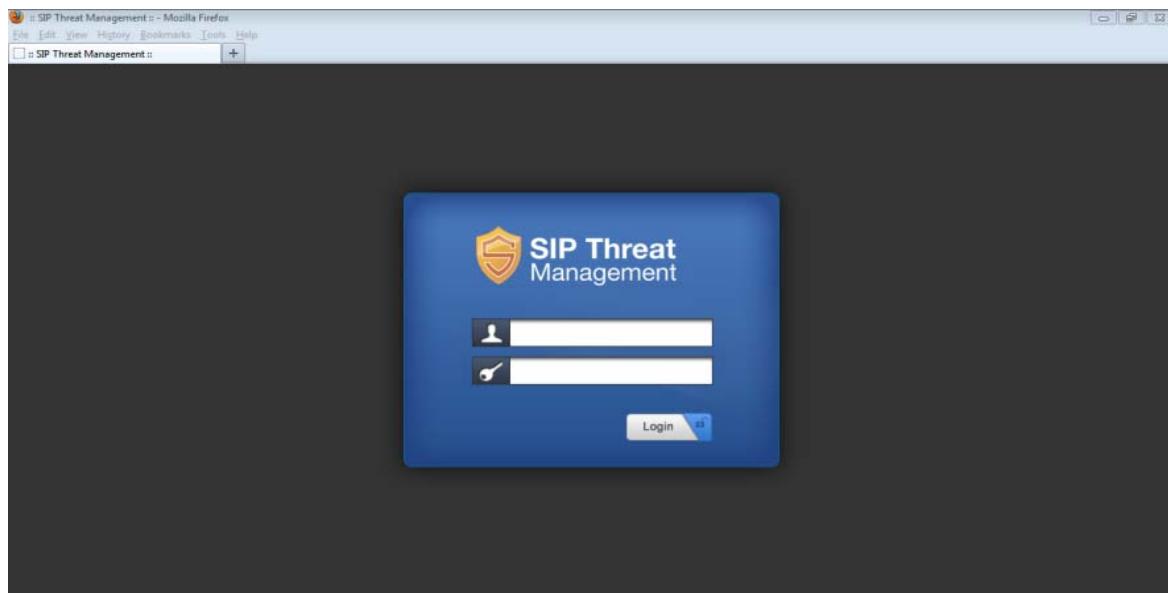
Configure the STM Device IP Address from the "Device Settings" Page as per your local network range. Verify the IP address set to STM from the dashboard page. Once the user assigns the STM Device IP Address successfully, he can access the device using that IP address further.

Now he can disconnect the PC and connect the LAN Port to the PBX/PBX Network that needs to be protected.

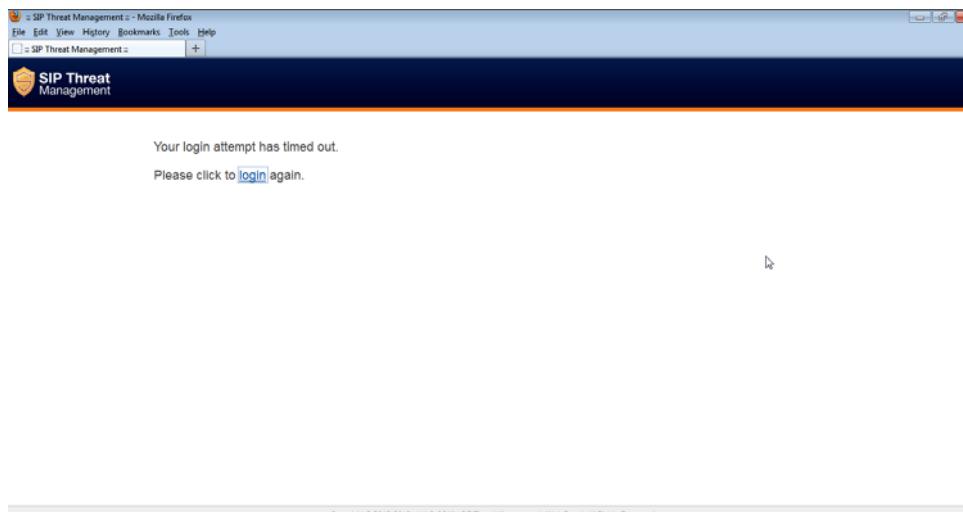
**Note:**

The UI allows the administrator to configure the management vlan ip address. In case if the user has changed the management vlan ip address, he needs to assign the corresponding network address to his PC for the management access subsequently.

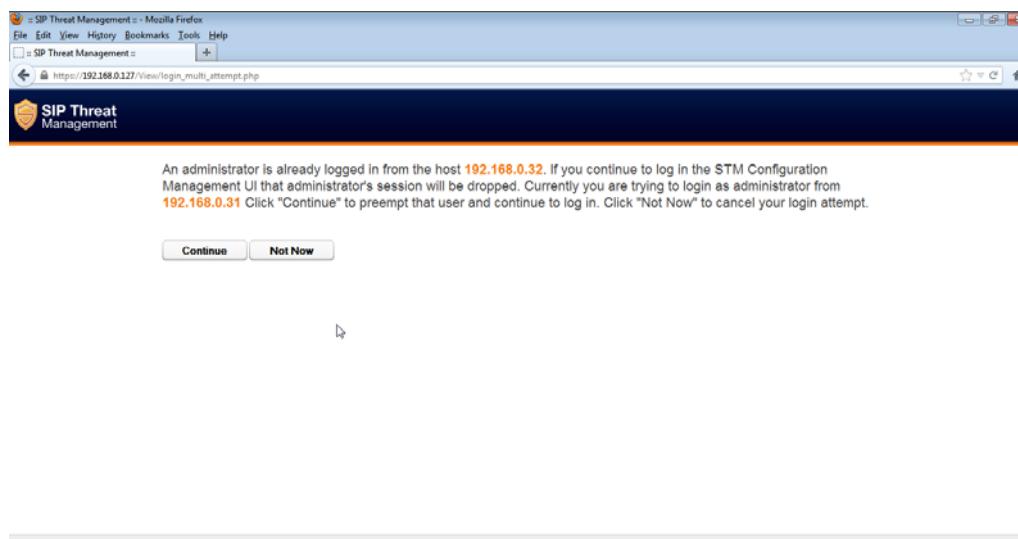
On launching the STM WebUI, the web application will prompt enter the administrator credentials to login.



The WebUI login session has been made to time out and if the user does not enter the login credentials for 30 seconds and will redirect to the informational page. The user can click the hyperlink named as 'login' appearing on the information page, to visit the login page again.



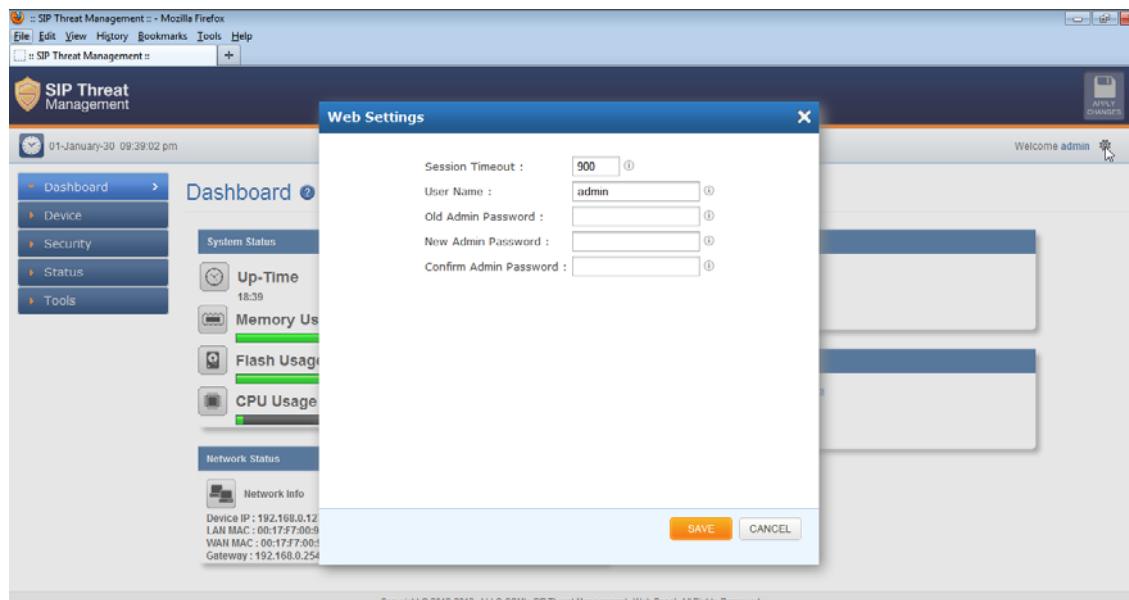
If somebody is already logged in to STM WebUI session, the subsequent attempts to login will notify the details previous login session as illustrated below and will prompt the user to override the previous session and continue OR to discard the attempt the login.



## 2.4 WebUI Session timeout

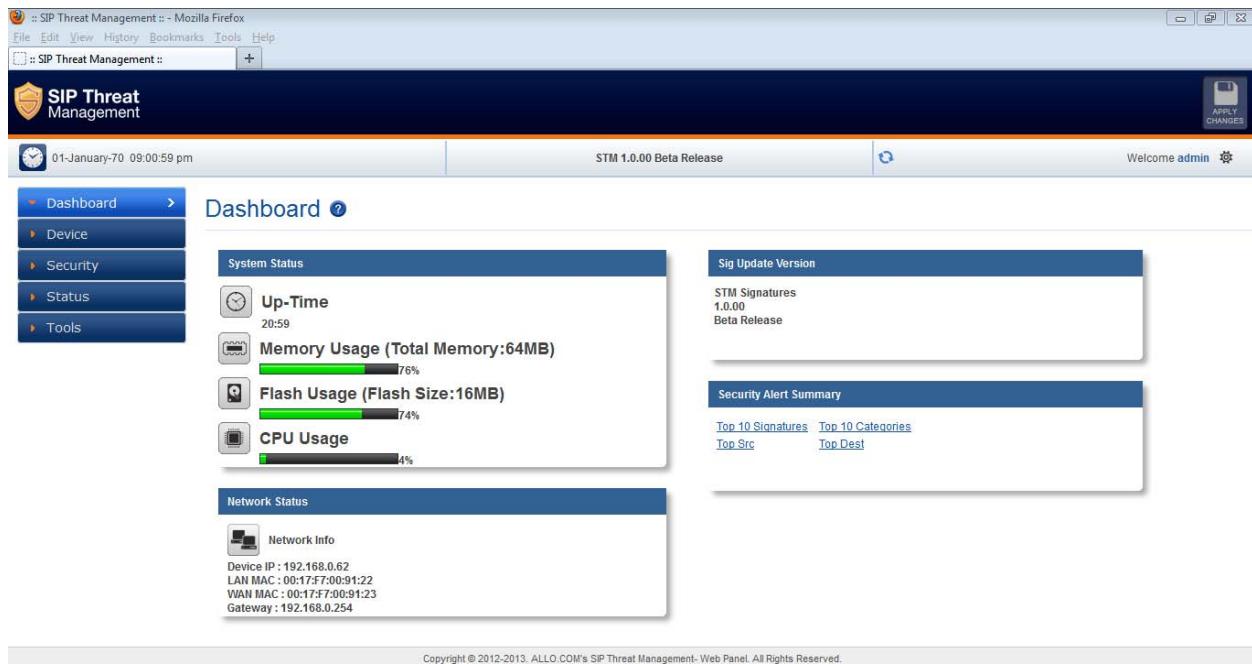
After logging into the WebUI, if there is no activity until the WebUI session timeout period ( By default, the WebUI session timeout is set to 900 seconds ), then the login session will automatically terminated and browser will be redirected to login page again.

## 2.5 WebUI Settings



To change the WebUI settings, click the settings icon that appears top right corner (below the Apply Changes button). The WebUI settings dialog will be displayed on the browser and allow the administrator to configure WebUI session timeout & WebUI login password. To configure the WebUI login password, the user needs to enter the previously set administrator password.

## 2.4 Dashboard



On logging into the STM WebUI, the dashboard will be shown.

The user can visit dashboard page from the any configuration page in the STM WebUI, by clicking the STM Product Icon that appears in the left corner of the Top panel.

The status panel that appears below the top panel shows the time settings on the device and STM firmware version, Page refresh icon and Setting icon.

On clicking the page refresh button, the main content area in the current page will be refreshed.

On clicking settings icon, the pop menu which contains menu options logout, WebUI settings will be shown.

System Status Panel shows Device up time, Memory Usage, Flash Usage & CPU Usage.

Sig Update Version Panel shows STM Signature version and Release State.

Network Status Panel shows IP, LAN MAC, WAN MAC and Gateway of the device.

Security Alert Summary Panel shows hyperlinks for viewing of Top 10 Signatures hit, Top 10 Categories hit, Top Attacker IP Addresses & Top 10 target destinations.

## 3. Device Configuration

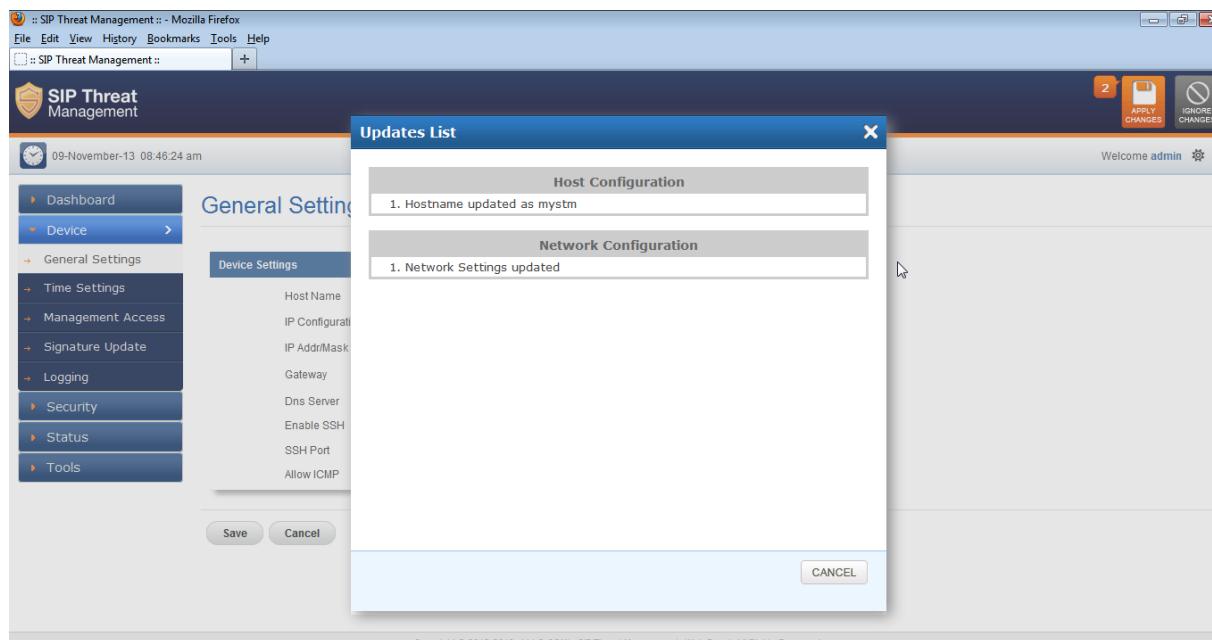
Configuration pages of the STM WebUI have been made as self- intuitive and easy to configure.

All the configuration pages have been made to work with the two-phase commit model.

**Note:**

The two-phase commit model is not applicable to time settings and signature update settings. In these settings, the changes will be applied directly on clicking the 'Apply' in the content area of the configuration editor.

i.e. When the administrator changes the settings in the configuration pages and click the Save button, the settings will be saved in a temporary buffer location on the device. On saving the configuration changes, the 'Apply Changes' button that appears in the right top corner will be enabled & the 'Ignore Changes' button will appear next.



The number of configuration changes will appear on the immediate left to the 'Apply Changes' button. To view the details of the configuration changes, the user can click the number icon, which will open the configuration changes listing.

The user can apply the configuration changes to the device, by clicking 'Apply Changes' button. On clicking the 'Apply Changes' button, the configuration changes will be applied to the system and updated configuration will be persisted permanently onto the device.

In case if the user want abandon the configuration changes made, he can click the Ignore Changes button. On clicking the 'Ignore Changes' button, the configuration changes stored in the temporary buffer location will be discarded.

**Note:**

On applying the configuration changes, the 'Ignore Changes' button will be disabled, he/she cannot choose to ignore configuration changes. The 'Ignore Changes' button will be disabled, only when there are pending configuration changes that need to be applied yet to the device.

**Note:**

If the administrator tries to configure a configuration element to the inappropriate value, then the tooltip icon that appears next to each configuration element will provide the details on the error.

On clicking the help icon that appears next to the configuration title, the help section corresponding the current configuration page will be launched.

### 3.1. General Settings

The General settings page will allow configuring the host/network settings of the STM appliance. The device that has been made to work in bridging mode can either choose to work with static ip assignment or to acquire the device ip via dhcp .

The page also allows to enable/disable the SSH Access to the device. The 'Allow ICMP' option will configure the device to respond to the ICMP ping messages sent to STM appliances or not.

By the SSH Access and ICMP Ping messages are allowed to the STM appliance.

General Settings

Device Settings

Host Name	sip_secure
IP Configuration	DHCP
IP Addr/Mask	
Gateway	
Dns Server	
Enable SSH	<input checked="" type="checkbox"/>
SSH Port	22
Allow ICMP	<input checked="" type="checkbox"/>

Save Cancel

## 3.2. Time Settings

The administrator can choose to set the manual time settings on the device or configure the device to sync the time settings from a ntp server. Appropriate time settings/timezone should be set on the device for the correct timestamp to appear on the SIP security alerts generated by the device.

Date / Time Settings

Configuration Type: NTP

Date/Time: 08 : 31 - 09 / 11 / 2013

Time Zone: UTC

NTP Server: 3.in.pool.ntp.org, 4.in.pool.ntp.org

Apply Cancel

## 3.3. Management Access

The access the STM Device management (SSH CLI / WebUI Access) can be restricted with the management access filters. By default, the access has been allowed to any global address and management vlan network configuration configure on the device. The administrator can override these settings.

Name	IP Type	Address	Enabled	Comments	Options
DefaultAllAccess	ANY	0.0.0.0/0	True	Default rule that allows access to the device from anywhere	
MgmtVlanAccess	NETWORK	192.168.100.0/24	True	Access from Mgmt Vlan network	

Add New Delete Selected

The administrator needs to configure the IP Address or the IP Network or the Range of IP Addresses from with management access to the device should be allowed in the management access filter rule. The IP Type 'ANY' indicates global network ( Any network/ip address ).

The search option in the management access filters table will help in selectively viewing the management access filter rules whose name/address values that match with the search criteria.

### 3.4. Signature Update

To enable the automatic signature update, select the checkbox 'enable update' on the device and configure the signature update schedule. The valid subscription key and correct signature update url should be configured for the signature update to happen.

To update the signatures on the device instantaneously, Click 'Update Signatures now' button.

**Note:**

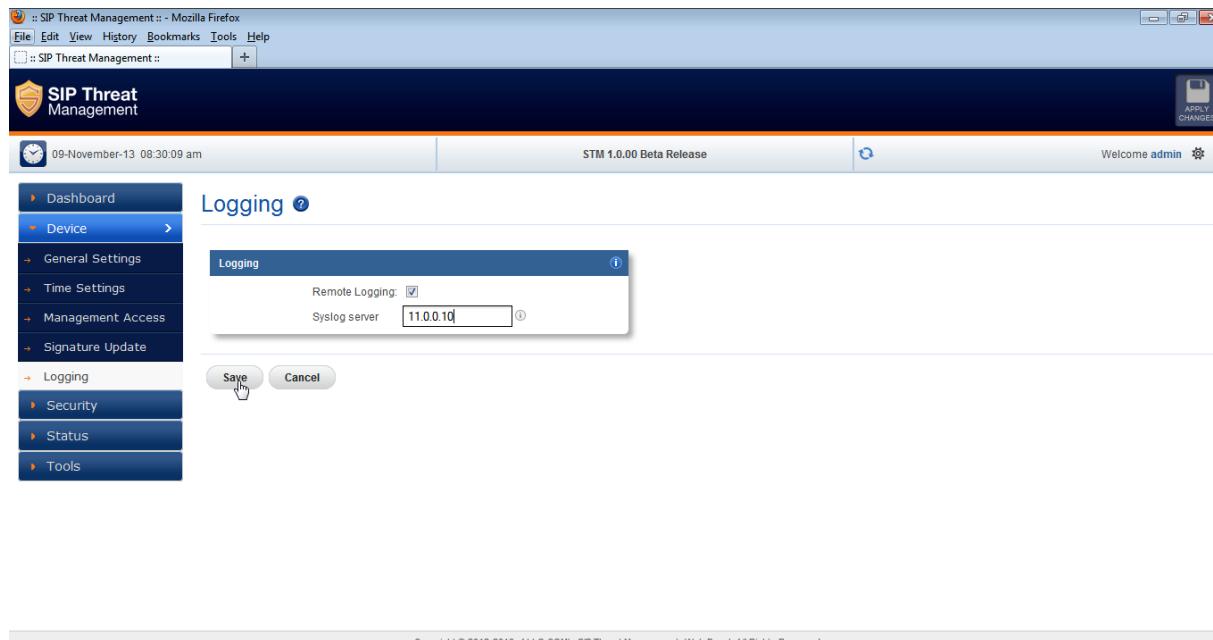
When the user buys the STM appliance, the device will be shipped with the SIP signatures that will help in protecting against the SIP based attacks known as of date.

However, if the user wants to ensure that his/her SIP Deployments gets the protection against the newer attack vectors, it is recommended to enable the signature update on the device. Please check with CEM Solutions Sales representative on getting the details of purchasing the STM signature subscription key.

## 3.5. Logging

The administrator can configure the STM appliance to send the security alerts generated on detecting the SIP based attacks, to the remote syslog server.

The logging page will allow enable/disable the remote logging of security alerts and to which syslog server the security alerts are to be forwarded.



STM 1.0.0 Beta Release

09-November-13 08:30:09 am

Welcome admin

APPLY CHANGES

Logging

Logging

Remote Logging:

Syslog server: 11.0.0.1

Save Cancel

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# 4. Configuring the SIP Security Policies

## 4.1. SIP Protocol Compliance

The SIP Deep packet inspection engine running the STM appliance has been made to inspect the SIP traffic with the SIP Security Compliance rules in built into the SIP DPI engine.

The anomalies in the SIP Message headers can result to various erroneous conditions, SIP parser failures & malformed packets which will lead to SIP applications vulnerable to attacks.

The following parameters will be used by the SIP deep packet engine for identifying the different protocol anomaly conditions and take the action configured by the administrator.

**Note:**

Configuring inappropriate values for these parameters can result to disruptive impact in the VOIP deployment. Administrators with more in-depth understanding with the SIP Protocol can choose to tune these parameters for their specific deployment needs. Otherwise recommended to use the default settings for these parameters.

The screenshot shows the STM 1.0.00 web interface. The top navigation bar includes 'File', 'Edit', 'View', 'History', 'Bookmarks', 'Tools', and 'Help'. The title bar says 'Shield SIP Threat Management :: - Mozilla Firefox'. The main header 'SIP Threat Management' has a shield icon. The top right has 'APPLY CHANGES' and a user 'admin'. The left sidebar has a 'Security Settings' section with 'SIP Protocol Compliance' selected. The main content area has two tabs: 'SIP Protocol Compliance Settings' and 'SIP/MEDIA Ports Configuration'. The 'SIP Protocol Compliance Settings' tab shows various configuration parameters like Max Sessions (4096), Max Dialogs per session (10), and SIP Methods (a dropdown list including invite, cancel, ack, bye, register, options, refer, subscribe, update, join, info, message, notify, notify, do). The 'SIP/MEDIA Ports Configuration' tab shows SIP Transport (any), SIP Ports (5060,5061), Media Transport (udp), and Media Ports (1024-65535). At the bottom are 'Save' and 'Cancel' buttons, and a copyright notice: 'Copyright © 2013-2015. Shield SIP Threat Management - Web Panel. All Rights Reserved.'

**Max\_sessions**

A SIP session is the application level connection setup created between the SIP server and SIP client for exchanging the audio/video messages with each other.

The max\_sessions parameter defines the maximum number session that SIP deep packet inspection engine can keep track of. The default value has been set as 4096.

**Max Dialogs per session**

Max\_Dialogs\_per\_session specifies the maximum number of SIP messages transaction that can happen between the SIP server and client.

**Methods**

This specifies on what methods to check for SIP messages.

Following are the SIP messages that SIP DPI Engine can identify: (1) invite, (2) cancel, (3) ack, (4) bye, (5) register, (6) options, (7) refer, (8) subscribe, (9) update (10) join (11) info (12) message (13) notify (14) prack.

**Max\_uri\_len**

The uri identifies the user or service to which SIP request is being addressed. Max\_uri\_len specifies the maximum Request URI field size. Default is set to 256. The allowed range for this option is 1 - 65535.

**Max\_call\_id\_len**

The Call-ID header field in SIP message acts as a unique identifier that relates to sequence of messages exchanged between SIP client and server. Max\_call\_id\_len specifies the maximum Call-ID field size. Default is set to 256. The allowed range for this option is 1 - 65535.

**Max\_requestName\_len**

Max\_requestName\_len specifies the maximum request name size that is part of the CSeq ID. Default is set to 20. The allowed range for this option is 1 - 65535

**Max\_from\_len**

The From header field indicates the identity of the initiator of the SIP request. Max\_from\_len specifies the maximum From field size. The allowed range for this option is 1 - 65535.

**Max\_to\_len**

The To header field specifies the desired recipient of the SIP request. Max\_to\_len specifies the maximum To field size. Default is set to 256. The allowed range for this option is 1 - 65535.

**Max\_via\_len**

The Via header field indicates the transport used for the SIP transaction & identifies the location where the SIP response is to be sent.

Max\_via\_len specifies the maximum Via field size. Default is set to 1024. The allowed range for this option is 1 - 65535.

### Max\_contact\_len

Identifier used to contact that specific instance of the SIP client/server for subsequent requests. Max\_contact\_len specifies the maximum Contact field size. Default is set to 256. The allowed range for this option is 1 - 65535.

### Max\_content\_len

Max\_content\_len specifies the maximum content length of the message body. Default is set to 1024. The allowed range for this option is 1 - 65535.

## 4.2. SIP Attacks Detection Policies

The SIP Attack Detection page allows to configure the SIP Deep packet Inspection rules categories. The administrator can enable/disable the inspection against particular category of rules, action to be taken on detecting attacks matching the rules in the categories.

The possible actions that the STM can execute are log the alert, block the packets containing the attack vector and blacklist the attacker ip for the given duration. The blocking duration of how long the attacker up needs to be blocked is also configure per category level.

The table given below lists the SIP Deep packet Inspection rules categories supported in STM and configuration parameters in each category.

Category	Description	User Configurable options

SIP Reconnaissance Attacks	The intruder is trying to detect what version of Asterisk you are running. With that info, he will start exploiting the numerous vulnerabilities of that version. The STM will not respond to his query.	N/A
SIP Devices Scanning	The intruder will scan the PBX ports to see what devices are connected to it. With that info, he can exploit 3rd party vulnerabilities. The STM will not respond to his query.	N/A
SIP Extensions Discovery	The intruder will ask the PBX to divulge the range of the extension numbers. With that info, he can try different passwords to take control of these extensions. The STM will not respond to that query.	Invalid SIP User Registration Attempts/Duration
Multiple Authentication Failures/Bruteforce password Attempt	The intruder will try to log in with different user names and passwords multiple times. Once he succeeds, he will have control of that extension. The STM can block, log or blacklist the IP for a period of time if it exceeds the authorized number of trials/second.	Failed Authentication Attempts/Duration
Ghost calls Attempt	The intruder will generate calls to an extension and it will look like the calls come from that same extension. His goal is to crash the PBX resulting in disrupted communication. The STM can block, log or blacklist the IP for a period of time if it exceeds the authorized number of trials/second.	No of Anonymous Invite Responses/Duration
SIP Dos Attacks	Flooding attempts using various SIP messages.	No of SIP Request Messages/Duration
SIP DDos Attacks	Distributed flooding attempts using various SIP messages.	No of SIP Response Messages/Duration
SIP Anomaly attacks	The intruder will send abnormal SIP packets to the PBX. His goal is to crash the PBX resulting in disrupted communication. The STM can block, log or blacklist the IP for a period of time if it exceeds the authorized	N/A

	number of trials/second.	
SIP Buffer overflow attacks	Buffer overflow attempts resulted from improper validation of user inputs.	N/A
SIP Cross site scripting	SIP is vulnerable to cross-site scripting, caused by improper validation of user-supplied input in a SIP request. A remote attacker could exploit this vulnerability to inject malicious script into a Web page which would be executed in a victim's Web browser, when the victim accessed a web page containing information taken from the SIP request.	N/A
3rd Party vendor vulnerabilities	Attacks targeted towards PBX/SIP Gateway appliances exploiting their vulnerabilities.	N/A

### 4.3. Firewall Rules

The firewall rules configuration will allow the administrator in configuring what traffic should be allowed to protected SIP PBX/Gateway network from untrusted wan zone, besides DPI enabled SIP traffic and RTP traffic. The administrator needs to specify the source and destination networks and port numbers and protocol that will be used as the matching criteria in the filtering rule and action to be taken on matching the filtering rule. The possible actions are to block the traffic and allow the traffic on matching the filtering rule. The rules precedence will be in the order in which the rules configured on firewall rules table.

Port	Action	Options
67,68	Allow	
53	Allow	
0	Allow	
123	Allow	
22	Allow	
23	Allow	
80,443,8080,8088	Allow	

## 4.4. White list Rules

This page allows to configure the white listed ip addresses in the untrusted wan zone from which the access to communicate with the protected SIP network will be allowed by the STM firewall.

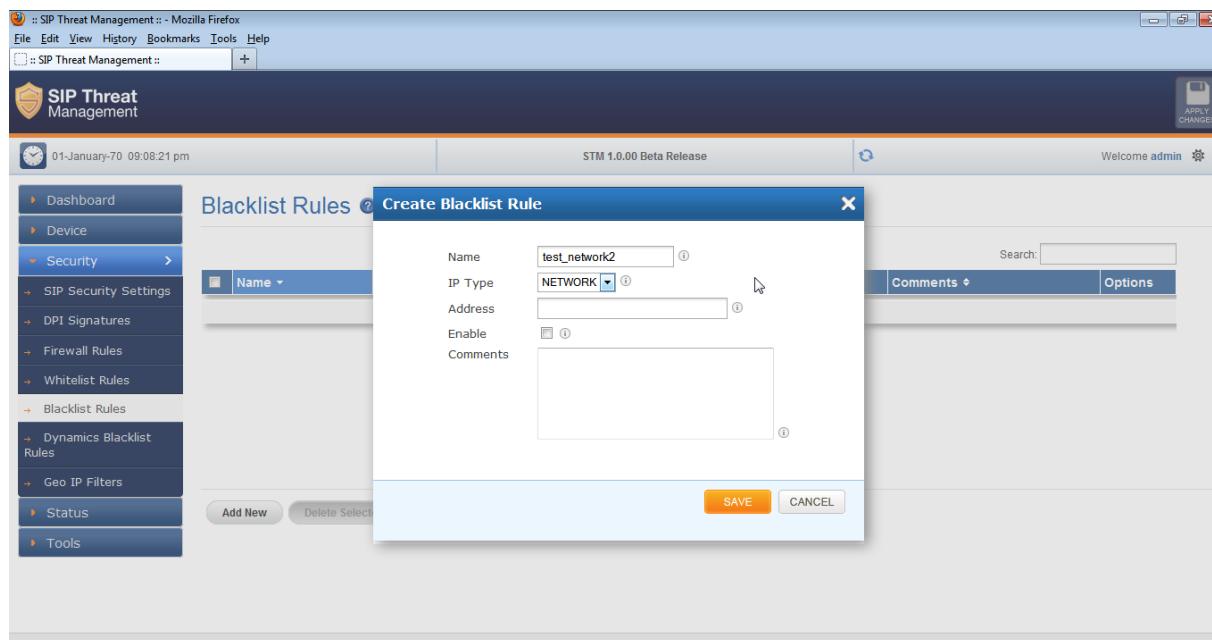
This page will also allows configuring whether the white rules take precedence over the blacklist rules (both static and dynamic) configured on the device at any instant.

The screenshot shows the STM 1.0.00 Beta Release web interface. The top navigation bar includes 'File', 'Edit', 'View', 'History', 'Bookmarks', 'Tools', and 'Help'. The title bar says 'SIP Threat Management :: - Mozilla Firefox'. The main content area is titled 'Whitelist Rules'. A sidebar on the left shows collapsed sections for 'Dashboard', 'Device', 'Security', 'SIP Security Settings', 'DPI Signatures', 'Firewall Rules', 'Whitelist Rules' (which is expanded), 'Blacklist Rules', 'Dynamics Blacklist Rules', 'Geo IP Filters', 'Status', and 'Tools'. A table header is visible with columns for 'Name', 'IP Type', 'Address', 'Enabled', 'Comments', and 'Options'. A note at the bottom of the table says 'No data available.' Below the table are 'Add New' and 'Delete Selected' buttons. The bottom of the page has a copyright notice: 'Copyright © 2012-2013. All in One's SIP Threat Management. Web Panel. All Rights Reserved'.

## 4.5. Blacklist Rules (Static)

This page allows to configure the black listed ip addresses in the untrusted wan zone from which the access to communicate with the protected SIP network will be blocked by the STM firewall.

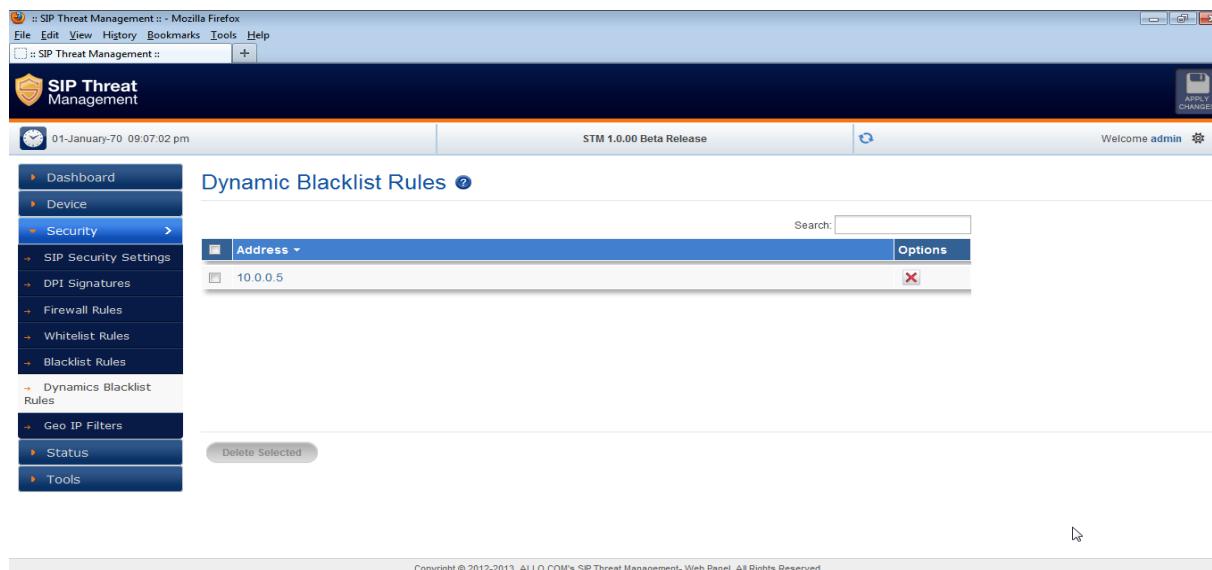
This page will also allows configuring whether the white rules take precedence over the blacklist rules (both static and dynamic) configured on the device at any instant.



## 4.6. Dynamic Blacklist Rules

The dynamic blacklist rules are the blocking rules added by the STM SIP deep packet inspection engine to block the traffic from attacker ip addresses for the blocking duration configured in the rules category, on detecting the attack.

The dynamic blacklist rules will allow the administrator to see the dynamic blacklist rules currently configured on the device at any instant. In case if the administrator wants to override and allow the traffic from particular blacklisted ip, he can delete the rule from the dynamic blacklist rules page.



## 4.7. Geo IP Filter

The administrator can choose to block the traffic originating from the specific countries towards the protected SIP network, by configuring the GeoIP filter rules in STM

Geo IP Filters

Country Name	Allowed	Options
RUSSIAN FEDERATION	<input checked="" type="checkbox"/>	
SYRIAN ARAB REPUBLIC	<input checked="" type="checkbox"/>	
SUDAN	<input checked="" type="checkbox"/>	
NIGERIA	<input checked="" type="checkbox"/>	
KOREA, REPUBLIC OF	<input checked="" type="checkbox"/>	
CHINA	<input checked="" type="checkbox"/>	
UKRAINE	<input checked="" type="checkbox"/>	
ALGERIA	<input checked="" type="checkbox"/>	

# 5. Status

## 5.1. Security Alerts

The status alerts page shows the list of alerts pertaining to the SIP attacks detected by the STM SIP Deep packet inspection engine at any instant.

The administrator can choose to set log viewer page refresh interval in this page.

The administrator can choose to configure the device to send email notifications summary about the security alerts generated by the device.

The option to download the security alerts shown in this page in CSV format is available in the page.

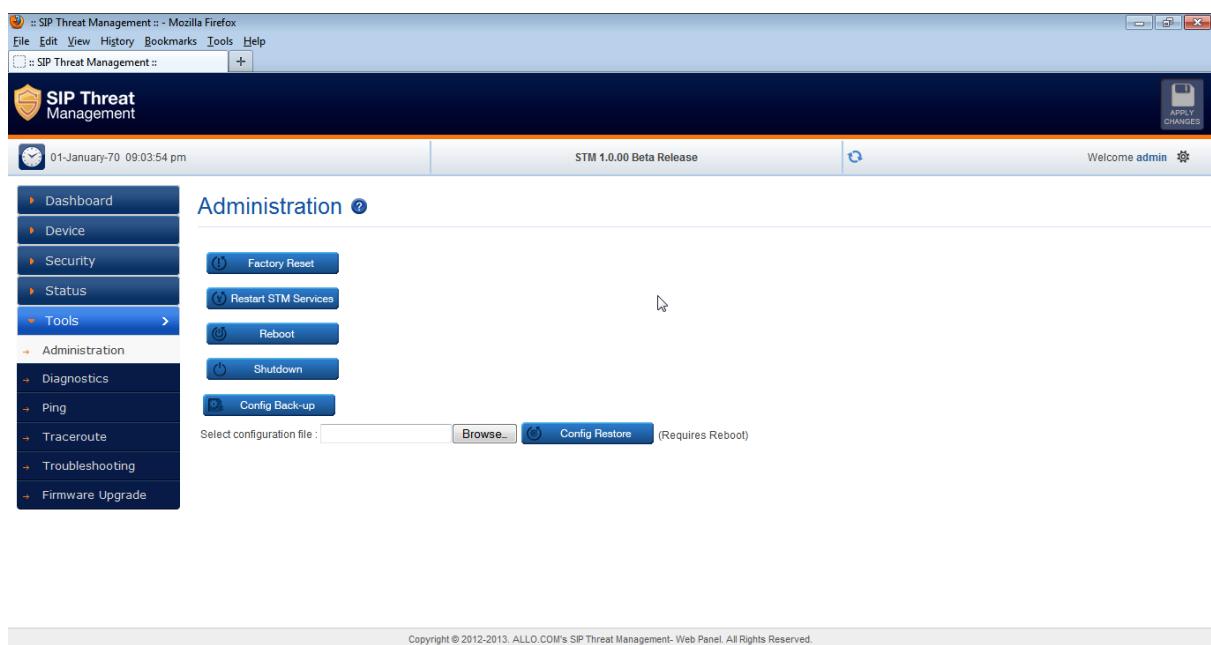
Time	ID	Category	Message	Src IP	Src Port	Dst IP	Dst Port	Protocol	Action
03/04-05:52:16.952691	100020001	10002	"STM Sigs: SIP Devices Identification Attempt"	162.210.199.78	5169	203.196.148.210	5060	UDP	Blacklist

### Note:

Unless the user configures to forward the security alerts to remote syslog server, the security alerts are not persisted permanently on the device. The logging buffer location will be flushed at the predefined interval (not configurable) will once the logging threshold criteria met. However if the administrator wants to persist the alerts into an usb storage, he/she can connect the usb storage to the usb data port of STM appliance. The rotated logs will be automatically archived in CSV format in to usb storage by the STM appliance.

# 6. Device Administration

## 6.1. Administration



The Administration user interface page provides the option for running factory reset on the device, restarting the device, device reboot, device shutdown & Configuration backup/restore.

Running factory-reset on the device requires reboot, thus the administrator will be redirected wait notification page on clicking the factory reset button and will be prompted login once the device comes up with the default configuration.

The STM appliances support taking the configuration backup and restore the configuration later.

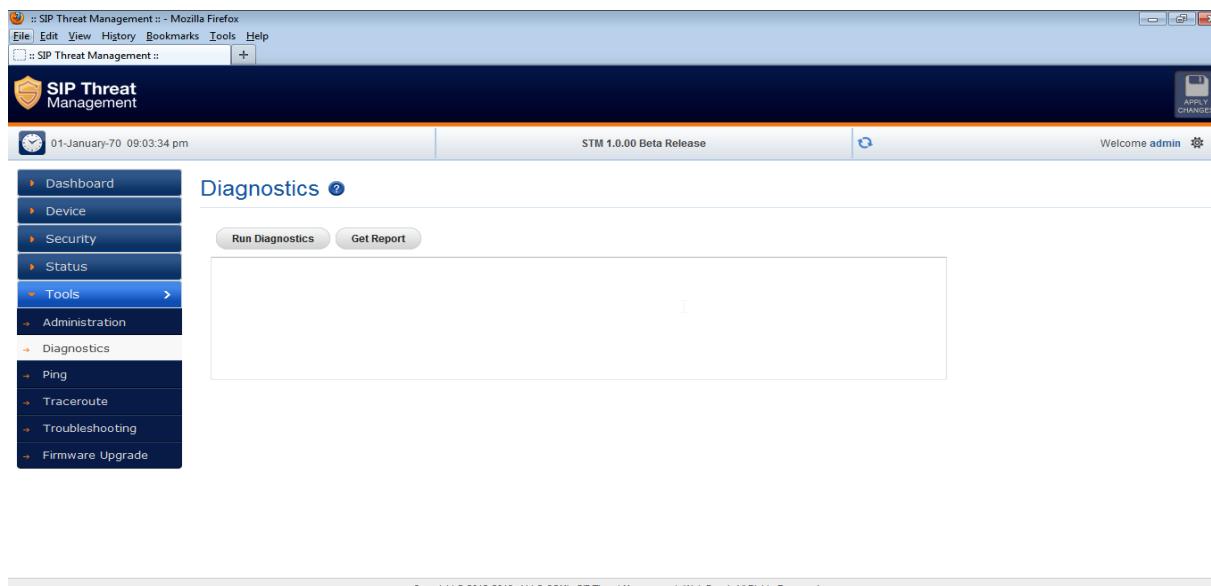
**Note:**

The configuration backup will contain the lastly persisted configuration. If there are any transient changes that are yet to be applied while taking the backup, those configuration changes will not be included in the configuration backup archive.

## 6.2. Diagnostics

The diagnostics page will allow the administrator to gather the troubleshooting logs which will help our Support team in debugging any issues faced with STM deployment setup.

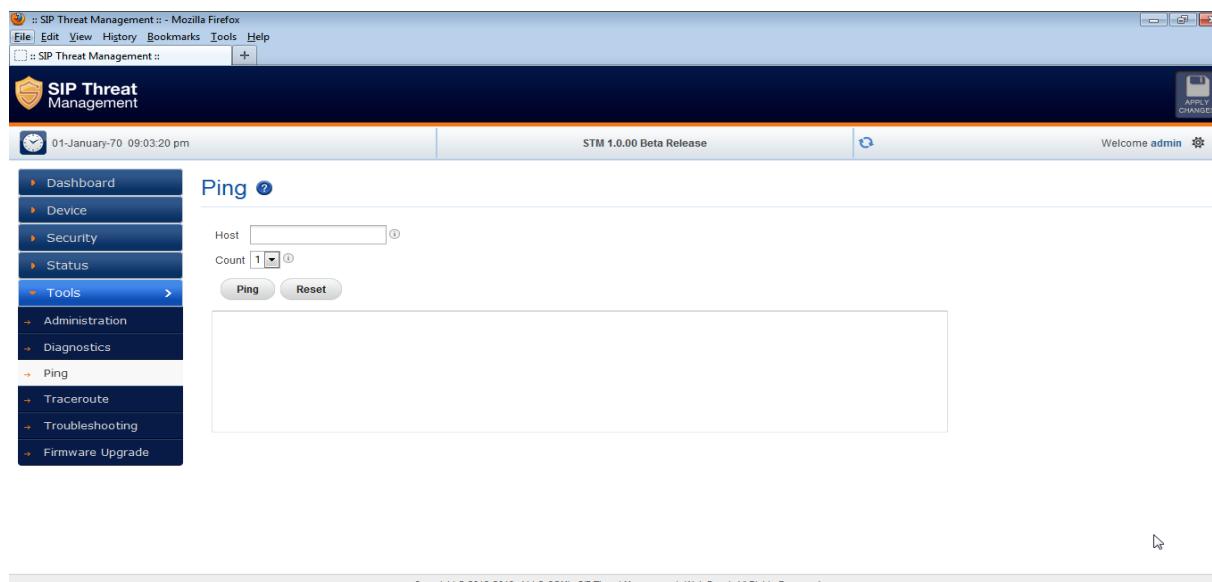
To run the utility on the device, the administrator needs to click the 'Run diagnostics' button. The device will run the diagnostics task in the backend and display the results once the task is complete. The administrator can download the reports by clicking the 'Get Report' button and send the report to our Support team ( Note: You can submit through support ticket: <http://support.allo.com> )



## 6.3. Ping

The administrator can troubleshoot the network connectivity issues with running ping from the STM device.

The administrator needs to enter the IP address that needs to be pinged from the STM appliance/ping count and click the 'Ping' button to run the task. The ping results will be displayed in the text area once the ping task is complete.

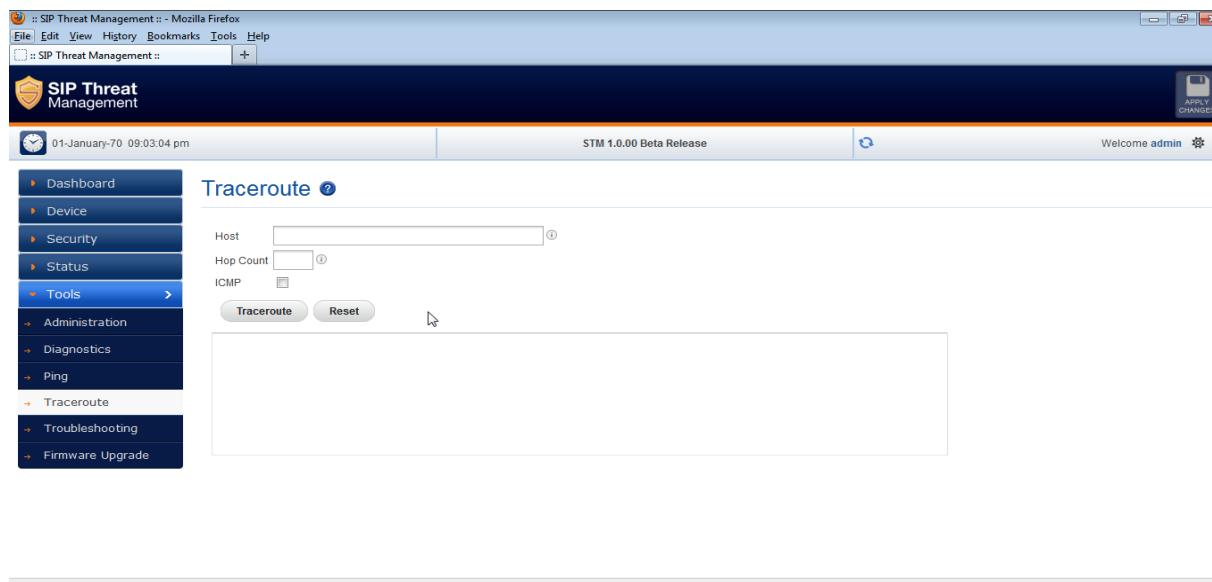


## 6.4. Traceroute

The administrator can troubleshoot the network connectivity issues with running traceroute from the STM device.

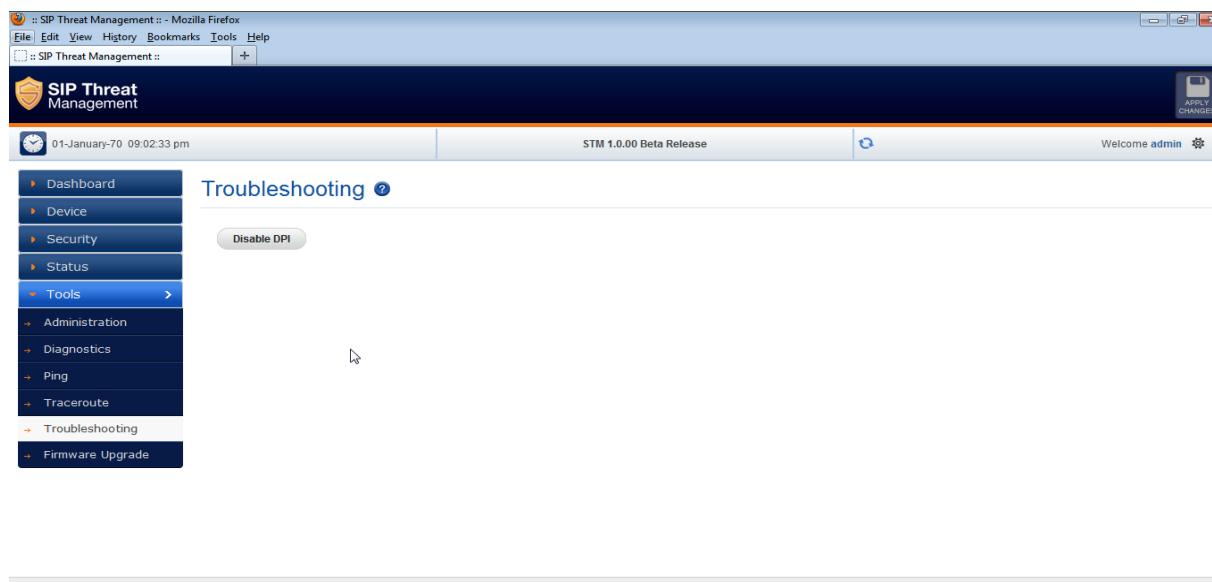
The administrator needs to enter the IP address to which the route needs to be traced from the STM appliance/hop count and click the 'Traceroute' button to run the task.

The traceroute results will be displayed in the text area once the traceroute task is complete.



## 6.5. Troubleshooting

This page will allow disable/enable the DPI on the STM appliance for troubleshooting purposes.

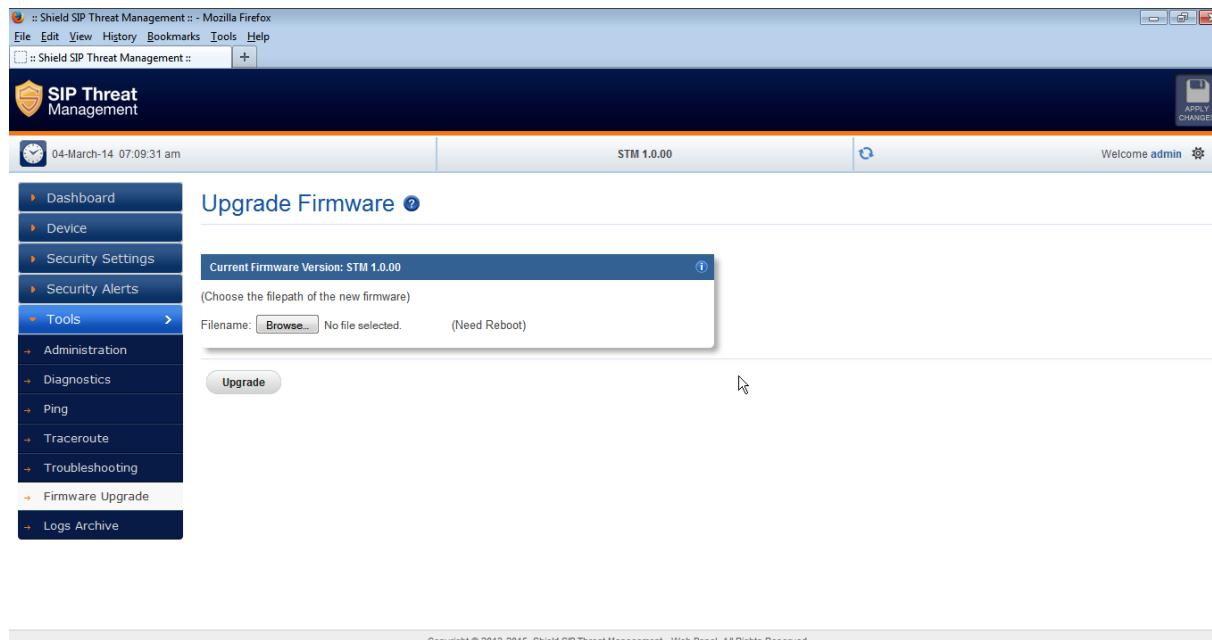


## 6.6. Firmware Upgrade

The STM appliance supports the manual upgrade on the STM firmware running on the appliance. The firmware upgrade page shows the currently running STM firmware version and allows the administrator to upload the firmware update package onto the device and install.

To install the firmware,

- Download the STM firmware update package from CEM website and keep it your local system.
- From the browser in your local system, login to STM WebUI and launch the STM firmware upgrade page.
- Click the 'Browse' in the firmware page and select the STM firmware update package file that you saved in your local system.
- After selecting the file, click the 'Upgrade' button.
- The device will verify the firmware uploaded and install. After install the device will reboot and administrator will be redirected the login page.



## 6.7. Logs Archive

If the USB storage device attached to STM, the device will attempt to archive older logs in the USB storage device. The summary information on the logs stored on archive will be shown in the Logs Archive Page.

## 7. Appendix A – Using Console Access

1. Connect the serial console the serial port of STM device.
2. Use the following serial console settings to access the 'Shield' CLI
  - i. Speed : 38400
  - ii. Parity : None
  - iii. Data : 8
  - iv. Stop bits : 1
  - v. Flow control : No
3. The user should see the 'Shield' command prompt on the terminal
4. Type 'help' to view the list of troubleshooting commands available.

## 8. Appendix B – Configuring STM IP Address via Console

The user can choose to view/set the ip address of the STM device as given below.

```
shield>show ip
```

Now you can access the device from the browser using the URL as given below

<https://<device-ip>>

**Note:**

If you are not running the dhcp server in your deployment OR device fails to acquire the ip address, set the ip address from the console CLI using the command line

```
shield>set ip <ipaddress> <mask> <gateway>
```

Verify the address using the 'show ip' command. Then use this IP address, to access the WebUI/SSH to configure the device configuration further.

## Thanks for Choosing STM

Any Technical assistance required, Kindly raise the support ticket at

<http://support.allo.com/>